



THE INSTITUTE FOR PROFESSIONAL EDUCATION



DISTRIBUTED MINICOMPUTER NETWORKS

Robert M. Wainwright & Associates, Inc.

Washington, DC
September 8-10, 1976

San Francisco, California
October 6-8 1976

Washington, DC
November 10-12, 1976

New York, New York
December 1-3, 1976

CODE 60

PREPAID TUITION

Prepaid tuition, including course materials and luncheons, is \$395 per person. Checks should be made payable to The Institute for Professional Education.

BILLED TUITION

Cost of tuition that is billed at the close of the seminar is \$445, including course materials and luncheons. Classes begin at 9:00 a.m. and close at 5:00 p.m.

IPE CONTRACT EDUCATION PROGRAM

Any seminar can be presented for clients inhouse on contract. The seminar may be a replica of the public presentation, or it can be customized to meet any organization's specific requirements. In addition to those seminars presented in the public program, there are other seminars developed specifically for inhouse presentation. For further information and details of this program, please call (703) 527-8702.

TO REGISTER, to be placed on the mailing list, or to get additional information, please call (703) 527-8700, or write: THE INSTITUTE FOR PROFESSIONAL EDUCATION.

Suite 601
1901 North Fort Myer Drive
Arlington, VA 22209

Please state the Code number on the front panel of the brochure when registering by phone or letter.

IPE CURRICULUM SUBJECTS

Minicomputer Systems
Practical Leadership of Data Processing Projects
Applied Data Communications Design
Data Base Concepts and Approach
Data Base Design, Implementation and Administration
Effective Computer Operations Management
Implementation of Performance Management
Measuring and Evaluating Computer Performance
Structured Programming
Structured Systems Analysis Design and Implementation
Network Analysis, Design and Support
How to Design and Implement a Distributed Computing Facility

Computer Security and Privacy Systems Design
Computerized Auditing and Controls
Design and Development of Computer System Functional Specifications
Theory Z
Managing Engineers Effectively
Word Processing
Managing Large Scale, On-Line Data Processing Projects
Microfilm Systems
Multivariate Analysis
Time-Series Analysis
Regression and Correlation
Clustering and Numerical Classification
Model Fitting

THE INSTITUTE FOR PROFESSIONAL EDUCATION

The Institute (IPE) is a non-profit organization dedicated to the provision of technical, post-graduate-level education in computer, statistical, and management sciences. IPE training emphasizes application to real life problems. Seminar leaders are eminently qualified professionals. They serve as consultants to business, industry, education and government and are thoroughly experienced in providing solutions to usual or unusual problems. Each presentation is designed for specific backgrounds and experience level.

The Institute does not discriminate against anyone.

Scholarships are available to physically handicapped professionals and to bonafide graduate students and faculty members. Application should be made to: President, The Institute for Professional Education.

LOCATION AND HOTEL ACCOMMODATIONS

Seminars are presented at the hotels listed below. The cost of hotel rooms is not included in the tuition. Because of the personalized nature of hotel accommodations, IPE does not arrange hotel reservations; however, the hotels hold a block of rooms for participants until two weeks before the seminar. Hotel reservation cards will be forwarded with registration confirmations. We suggest you call or write the hotel directly mentioning IPE; the seminar; and dates attending.

September 8-10, 1976

Ramada Inn — Rosslyn
1900 North Fort Myer Drive
Arlington, Virginia 22209
Room Reservations: (703) 527-4814

October 6-8, 1976

Miyako Hotel
Japan Center, 1625 Post Street
San Francisco, California 94115
Room Reservations: (415) 922-3200

November 10-12, 1976

Ramada Inn — Rosslyn
1900 North Fort Myer Drive
Arlington, Virginia 22209
Room Reservations: (703) 527-4814

December 1-3, 1976

Barbizon Plaza Hotel
106 Central Park South
New York, New York 10019
Room Reservations: (212) 247-7000

CANCELLATION POLICY — Registrants cancelling less than two weeks prior to the scheduled date of presentation are subject to a \$50 service charge.

CONCEPT: This seminar addresses the minicomputer from the viewpoint of the distributed network user. The minicomputer, which is just now being applied in a manner to satisfy the organization with a large computational/communications requirement, provides an economical alternative to the large centralized system. The historical development of computer systems introduces this seminar to put the topic in perspective. The structure and management of a large data base, the software problems with the tradeoffs of languages utilized, from micro code to high level languages, hardware types, I/O options, device controllers, system failure and recovery, sample application case studies, and the economics of minicomputer application are all covered in depth in a cohesive discussion.

OBJECTIVE: Minicomputer applications to distributive requirements is a philosophical trend which will become more widely recognized as the successful systems come on stream. The concepts learned here, when taken away and applied will mean reduced system costs, both in implementation and operations, with a distributed requirement.

PERSONAL BENEFITS: Systems designers, planners, network designers, operational and support personnel will discuss the newest developments in the applied technology of economical distributed minicomputer networks. This seminar and the comprehensive reference manual which is given to each attendee will provide a solid foundation for the design, implementation, operation, and support of these new systems.

Satisfactory completion of this course earns 1.8 Continuing Education Units.

SEMINAR OUTLINE

- I. **INTRODUCTION**
 - A. Course Discussion
 - B. Introduction of Attendees
- II. **INTRODUCTION TO MINICOMPUTERS**
 - A. Definition of Minicomputers
 - B. Current Uses
 - C. Capabilities and Limitations
 - D. Vendors
 - E. The Impact of Minicomputers
- III. **DISTRIBUTED PROCESSING FUNCTIONS**
 - A. Historical Perspective
 - B. Important Distributed System Definitions
 - C. Potential Problem Areas
 - D. Anticipated Advantages
 - E. Elements of a Well Executed Design
 - F. Processing Levels
 - G. Network Addressing
 - H. Network Queuing
 - I. Information Path Considerations
 - J. Element Connectivity Concepts
 - K. Data Base and File Organization Alternatives
 - L. Network and Communications Aspects
- IV. **MINICOMPUTER HARDWARE, TYPES AND ANALYSES**
 - A. Evaluation Features
 - B. Principal Hardware Definitions
 - C. CPU Classes
 - D. Machine Organizations
 - E. Instruction Types
 - F. Arithmetic Unit
 - G. Modification Types
 - H. Stack Processing
 - I. Computer Bus Types
 - J. Computer Memory Types
 - K. Interrupt Types
 - L. Performance and Price Evaluations of Minicomputers
- V. **I/O DEVICE CONTROLLERS AND DEVICES**
 - A. Microprocessor Controllers
 - B. Secondary Storage
 - C. Printers
 - D. Card Reader
 - E. I/O Processing
 - F. I/O Bus and Inter Computer Bus Control
 - G. Data Set Adapters (Microprocessors)
 - H. Line Controller Multiplexers
- VI. **DISTRIBUTED SYSTEM CONTROL**
 - A. Firmware/Microcode Loaders
 - B. Down Line Loading
 - C. Forms Storage and Edit Parameters
- VII. **SYSTEM RESTART AND RECOVERY**
 - A. Hardware Failures
 - B. Processing Levels and Locations
 - C. Failure Types
 - D. Failure Actions
 - E. Restart Actions
 - F. Recovery Actions
- VIII. **MINICOMPUTER SOFTWARE**
 - A. Languages
 - B. Operation Systems
 - C. I/O Drivers
 - D. Memory Utilization
 - E. Scheduling
 - F. Statistics Gathering and Logging
 - G. Security
 - H. Transaction Formats
 - I. Queuing
 - J. Tables
 - K. Communications Firmware
 - L. Line Protocols (SDLC)
 - M. Structured Programming
 - N. Transaction Processing
 - O. Response Time
 - P. Off-Line Software
 - Q. Diagnostic Software
- IX. **SUPPORT ELEMENTS**
 - A. Software
 - B. Environment
 - C. Spares
 - D. Diagnostics
 - E. Tools
 - F. Personnel
 - G. Diagnostics
 - H. Documentation
- X. **ECONOMICS OF MINICOMPUTERS**
 - A. Total Systems Approach
 - B. Centralized/Distributed Trade-off
 - C. Hardware/Firmware/Software Trade-offs
 - D. Evaluation and Selection
- XI. **MINICOMPUTER CONFIGURATIONS**
 - A. Rules
 - B. Standard Versus Optional Computer Features
 - C. Distributed Function Configurations
 - D. System Expansion
 - E. Bus and Ring Architectures
 - F. Reliability Configurations
- XII. **CASE STUDY**
- XIII. **TRENDS**
- XIV. **SUMMARY AND DISCUSSION**

The right to amend the syllabus or cancel the seminar is reserved.

THE INSTRUCTIONAL STAFF: This seminar will be led by one of the following individuals or a senior member of the IPE instructional staff.

ROBERT M. WAINWRIGHT is a Senior Professional Associate of The Institute for Professional Education with over 19 years of hard earned experience. He is an internationally recognized systems designer, lecturer, and consultant in the fields of data communications, minicomputers in distributed processing facilities, transaction driven systems, data base file structures and access methods, structured design, systems evaluation and configuration requiring recovery, expansion, flexibility and use of today's technologies. Mr. Wainwright has lectured, consulted and worked with over 200 major commercial, military, federal and state government, vendor and user organizations such as; NCC, TCA, ACM, DPMA, NORAD, ARMY, NAVY, AIR FORCE, ARPA, NELC, PENTAGON, AUTODIN, USDA, STATE OF ILL, LOS ALAMOS, BELL LABS, B of A, FNBC, FRB, SPNB, CMB; in systems/networks applications covering transportation, process and command control, administrative business, petrochemical and energy, merchandising, manufacturing, utilities, and services.

BILLY K. GEURIN is a Senior Professional Associate of The Institute for Professional Education. He has lectured and consulted internationally for several years in the fields of data communications and distributed minicomputer networks evaluation, design, implementation and operations. Mr. Geurin has over 18 years experience in on-line data communications systems and networks planning, data base structures and handling, operating systems capabilities, network operation and management requirements analysis, functional specification preparation, design selection and implementation, and system and network procedures development. Some of the areas in which Mr. Geurin has demonstrated specific expertise are computerized data communications systems, circuit switching systems, basic network design, interface design, and a broad range of support activities, especially in the area of technical control of distributed function systems, for many of the leading commercial, government and military communications organizations.

MR. KENNETH SHERMAN is a Professional Associate of The Institute for Professional Education. He has over twenty years technical and management experience in data communication, real time/on line data access systems, operational and functional audits, and time sharing applications. This background was gained in government and commercial industrial environment, including SAC Command and Control, Delta Air Lines, Federal Reserve Banking System, U.S. Treasury, Computer Credit Reporting Corporation of Los Angeles and Bank of America.

Mr. Sherman has his Masters Degrees in Electrical Engineering with specialization in Computer Sciences from USC.